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LAMONT GEOLOGICAL OBSERVATORY  
Columbia University  
Palisades, New York

(2) Quarterly Letter Report No. 9,  
April 1, 1963 - June 30, 1963.

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AUG 2 1963  
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(16) ARPA Order No. 218461;  
~~Project Scientist~~

Contractor: Columbia University  
Contract Date: 1 April 1961  
Contract Amount: \$154,180.00  
(15) Contract Number: Nonr 266 (82)  
Contract Expiration Date: 31 March 1964  
Project Scientist: Kenneth Hunkins  
Elmwood 9-2900

*all caps*

(6) Studies in marine geophysics and underwater sound  
from drifting ice stations,

- (1) NA
- (2) NA
- (3) NA
- (4) 30 Jun 63
- (5) 3p
- (6) NA
- (7) NA
- (8) NA
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- (15) NA
- (16) NA
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- (18) NA
- (19) NA
- (20) NA
- (21) NA

Fletcher's Ice Island (T-3)

Dr. Kenneth Hunkins, Mr. Ralph Shaver, and Mr. John Berry arrived at T-3 to carry out the summer program. They replaced Mr. Steve Brocoum and Mr. Winoc Bogaerts. The program this summer will include measurements of long and short-period ice vibrations, measurements of underwater ambient noise, precision depth recording, seismic profiling, gravity measurements, magnetic measurements, ocean current measurements, ocean bottom sampling, ocean water sampling for age determinations, measurements of thermal fluctuations at depth in the ocean, and navigation.

Seismic Refraction Studies

Equipment was assembled in preparation for the large-scale seismic program this fall. Dr. Hunkins will work with the group from the University of Wisconsin. Plans are to complete several long marine seismic refraction profiles north of Barrow, Alaska.

NO.OTS

### Data Reduction

#### T-3 Data:

Work continued on reducing data gathered at T-3. The drift track of T-3 was plotted up to 1 June 1963. On 4 April 1963, T-3 was at  $81^{\circ} 51.7' N$ ,  $156^{\circ} 22' W$  and on 1 June 1963 T-3 was at  $82^{\circ} 24.8' N$ ,  $159^{\circ} 23' W$ . During this period T-3 moved over a portion of the Canada Abyssal Plain. The water depth remained nearly constant at 3790.3 M. Waves from a strong subbottom reflector were consistently observed on reflection recordings. The reflection averaged about  $3/4$  sec after the bottom echo. This interface may correspond to the first strong reflecting interface observed on seismic profiler recordings made on ARLIS II while over the Wrangel Abyssal Plain. Dr. James Heirtzler completed a technical report entitled "Simultaneous Geomagnetic Measurements on an Ice Island Surface and 1000 feet Below". The experimental results discussed in this report were obtained on T-3 last fall and winter.

#### ARLIS II Data:

Much of the data gathered on ARLIS II has been reduced. The ocean-bottom seismograph measurements and the ice vibration measurements made during the same period have been reported in "The Seismic Motion of the Deep Ocean Floor" by D. D. Prentiss and J. I. Ewing. This is an annual report prepared for the Air Force Cambridge Research Center. The results will also appear in a published paper. At the AGU meeting last April, H. Kutschale presented a paper entitled "Seismic Profiler Measurements in the Siberia Basin: Arctic Ocean". Since this paper was presented, additional work was done on interpreting the profiler, PDR, and magnetics data. The results will appear in a published paper. H. Kutschale will present "A Long Refraction Profile on the Arctic Continental Shelf" at the IUGG meeting this August. Co-authors of this paper are E. Thiel, D. D'Andrea, K. Hunkins, and N. Ostenso. This paper should be ready to submit for publication shortly.

### Published Papers, Reports, and Papers Read at Meetings

Heirtzler, J.R., "Simultaneous Geomagnetic Measurements on an Ice Island Surface and 1000 ft. Below", Technical Report No. 7, CU-7-63 Geology, Contract Nonr 266 (82), May 1963, in press

Hunkins, K. and H. Kutschale, "Shallow Water Propagation in the Arctic Ocean", J. Acous. Soc. Am., 35, 542-551, 1963

Kutschale, H., E. Thiel, D. D'Andrea, K. Hunkins and N. Ostenso, "A Long Refraction Profile on the Arctic Continental Shelf", to be presented at the IUGG meeting this August

Kutschale, H., "Seismic Profiler Measurements in the Siberia Basin: Arctic Ocean", presented at the AGU symposium on sea floor studies last April.

Prentiss, D.D. and J.I. Ewing, "The Seismic Motion of the Deep Ocean Floor", Annual Report for period 1 April 1961 - 31 December 1962, prepared for Air Force Cambridge Research Center, Bedford, Mass., Contract number AF 19(604)8357, AFCL 63-250.

Prentiss, D.D. and J. I. Ewing, "The Seismic Motion of the Deep Ocean Floor",  
Bull. Geol. Soc. Am., vol 53, No. 4, pp 765-781, July 1963 (in press)

Total Expenditures to close of period (6/30/63)	\$160,394.00
Cost to completion	40,936.00